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QUARTERLY TECHNICAL SUMMARY REPORT,
OCTOBER-DECEMBER 1973

Royal A. Hartenberger

Teledyne Geotech

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SEISMIC DATA ANALYSIS CENTER QUARTERLY TECHNICAL
SUMMARY REPORT OCTOBER - DECEMBER 1973

AFTAC Project No.: VELA VT/4709
Project Title: Seismic Data Analysis Center
ARPA Order No.: 1620
ARPA Program Code No.: 3F10

Name of Contractor: TELEDYNE GEOTECH

Contract No.: F08606-74-C-0006
Date of Contract: 01 July 1973
Amount of Contract: \$2,152,172
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(703) 836-3882

P. O. Box 334, Alexandria, Virginia 22314

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A. OPERATIONS AND MAINTENANCE (Tasks 1 through 4)

1. Operations

During the quarter LASA data were recorded 96%, ALPA 97%, and NORSAR 93% of the available 2208 hours. Most of the outage reported by NORSAR was a result of attempts by communication personnel to improve the quality of transmission. The Trans-Atlantic Link experienced a high error rate of 1.5% during the early part of this report period. Subsequent work by ITT reduced this error rate to about 0.7%.

2. Programming

The majority of the effort by personnel supporting the 360 computer system was directed toward the initial design and study of the systems programming associated with the Data Management Plan. Programming related to the operating systems is described below.

2.1 EP and DP

A modification was made to the DP system in an attempt to reduce recording errors on the low rate tapes. Verification of the effects of this modification continues into the next report period.

The EP system was revised to include new regional corrections. Successful tests were conducted to verify the continuity of this system when the LASA E and F rings were turned off.

The program which produces the NORSAR bulletin was modified to output punched cards which can be

used to convert to paper tape on the PDP-15. This procedure avoids communication costs between our TWX machines for the purpose of punching paper tapes which are ultimately used to transmit the NORSAR bulletin.

2.2 360/44

A routine to plot outputs from the M7A beam-forming program was completed and documented. This routine plots research array long-period data in a form similar to the VLPE paper records. The programming and documentation of a program to read SDAC event tapes and produce SUBSET tapes was also completed during the quarter.

2.3 PDP-15

The PDP-15 system continued to provide processing for Analog-to-Digital conversion, Calcomp plotting, paper tapes for the SDAC seismic bulletin, and limited job shop work. Installation and acceptance of the 9-track 800/1600 bpi tape drives will expedite these activities. This new equipment will eliminate the need for 7-track-tapes and will facilitate the exchange of data between the IBM 360 and the PDP-15 systems.

Installation of the 9-track tape units and the reconfiguration of the PDP-15 system resulted in I/O timing constraints. Engineering change orders were installed in the system to correct the timing problems. These hardware changes were significant enough to cause us to install a newer version of the RSX operating system.

All coding of the SWAP system and about 80% of the documentation are complete. Most of the effort throughout this quarter was directed toward the accomplishment of these specific requirements. Checkout of the SWAP system was delayed by the installation of the engineering change orders and the resulting changes in the RSX operating system; errors in the RSX III operating system continue to delay checkout of SWAP. Work began on the VARIAN driver to establish coding requirements; coding will start early in January.

2.4 ARPA Network

The transfer of long-period seismic data to UCLA via the ARPANET was hampered by system problems at UCLA and operational problems at SDAC. However, some successful testing was conducted and results show maximum data transfer rates varying from eight to nine KB/second which is near optimum if validation is performed prior to subsequent transmission.

2.5 Analog Processing

Two digitizing requests were submitted during the quarter. One of these, the Rio Blanco project, was completed; the other, for long-period signals obtained from large explosions, is pending.

2.6 Documentation

No documentation was delivered to the project officer during this report period.

3. Maintenance

The trace assignments for the A develocorder have been changed to give six LASA vertical beam channels. Although calibrations have been performed, there is some doubt about the magnification computations for these traces.

4. Data Services

4.1 The library of seismic data at SDAC contains digital and analog magnetic tapes and film seismograms from the research arrays, LASA, NORSAR, ALPA, and from observatories operated early in the VELA program. It also contains analog tapes and films recorded in the LRSM program.

The library contains approximately 28,635 digital tapes and 36,165 analog tapes. The following list describes the various categories of digital tapes.

<u>Permanent Retention</u>	<u>No. of Tapes</u>
Event	536
Long-Period	3,802
Short-Period	
LASA	3,246
NORSAR	770
Detection log (International Seismic Month)	30
Miscellaneous (ALPA and LV Copies, etc.)	296
Long Period Experiment (LPE)	694

To be Recycled:

Short period	8,977
Detection log	26
Individual Users	1,270
Scratch Tapes	1,353

Permanent Save Tapes

UBO Multiplexed	281
LASA Multiplexed	1,199
TFO short period (ASDAS Tapes)	641
TFO long period (DGRADAS Tapes)	1,091
Library (A/D and D/D conversions)	2,058
Permanent Save Tapes	826
Operations tapes (scratch, save, etc.)	1,536

The analog library contains tapes in the following categories:

Compressed tapes	9,305
Composites	332
Tapes as recorded	17,967
Scheduled for compression	8,561

4.2 At the end of the quarter the SDAC weekly event summary was being mailed to thirty-one individuals or institutions. Routine processing of data for MIT Lincoln Laboratory was up to date.

4.3 The following institutions received documentation, data, and/or data processing services during the three month period ending 31 December 1973:

Massachusetts Institute of Technology, Mr. Peter Bird

Research Triangle Institute, Ms. Davis
Dept. Energy, Mines and Resources, Ottawa,
Dr. E. B. Manchee

MIT Lincoln Laboratory

California Institute of Technology, Dr. C. Archambeau
Dr. R. Hart

Lawrence Livermore Laboratory, Dr. J. Rose
Dr. H. Rodean
Dr. J. Woods

St. Louis University

Royal Norwegian Council for Scientific &
Industrial Research

Electronic Signal Processing, Inc., Dr. J. Beardwood

Teledyne Geotech, Garland, Texas, Mr. J. Moore
Mr. K. Veith

Weizmann Institute of Science, Dr. M. Shimshoni

University of California, San Diego, Mr. M. Reichle

University of Northern Illinois, Dr. L. Porter

University of Oklahoma, Dr. J. Lawson

Romona College, Dr. D. B. McIntyre

CIRES University of Colorado, Boulder, Dr. G.
Boucher

B. RESEARCH (Tasks 5 through 8)

Eight research reports and a detailed description of Network documentation are complete and are being reviewed.

The International Seismological Centre's Bulletin for the period 1964-1970 has been received. A memorandum comparing the International Seismic Month (20 February 1972 - 19 March 1972) epicentral

data is complete. Seismicity data files were regularly updated during the quarter.